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COINCIDENT LIDAR AND AIRCRAFT OBSERVATIONS OF
ENTRAINMENT INTO THERMALS AND MIXED LAYERS(U) AIR FORCE
GLOBAL WEATHER CENTRAL OFFUTT AFB NE T D CRUM ET AL
JUL 87 AFMC/JA-87/001

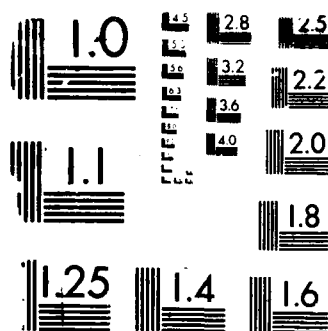
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REPORT DOCUMENTATION PAGE

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12. Personal Authors: Maj Timothy D. Crum (AFGWC/SDD), Roland B. Stull, and Edwin W. Eloranta
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19. Abstract: Coincident observations of the daytime convective boundary layer over Oklahoma were made with the NCAR Queen Air aircraft and the University of Wisconsin ground-based lidar. The two data sets have been merged to provide a unique visual representation of the temperature, moisture, vertical velocity, turbulent kinetic energy and the momentum fluxes in a field of thermals. These data show that horizontal moisture profiles observed in thermals penetrating the entrainment zone tend to exhibit more of a top-hat profile than the corresponding temperature or vertical velocity profiles. The specific humidities observed at various heights including cloud base 1) are frequently nearly constant along the horizontal tracks within each thermal; 2) show thermal-to-thermal variability; and 3) have values nearly the same as found in the surface layer. This paper also proposes the concept of an "intromission zone" describing the zone of lateral entrainment at the edges of active thermals. For the data studied here, a lateral entrainment velocity of 0.3 ms^{-1} was observed (Author).
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- 22a. Name of Responsible Individual: Col John W. Oliver
- 22b. Telephone: 402 294-3380 Autovon 271-3380
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